DMT
DANISH MYO TECHNOLOGY

# MINI TISSUE ORGAN BATH SYSTEM

## MODEL 751MT

**User Manual**

Version 1.1

# MINI TISSUE ORGAN BATH SYSTEM
# MODEL 751MT

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This documentation is provided with the
Mini Tissue Organ Bath System – Model 751mT

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# SAFETY

DMT Mini Tissue Organ Bath System - 751mT has been designed for use only in teaching and research applications. It is not intended for clinical or critical life-care use and should never be used for these purposes; nor for the prevention, diagnosis, curing, treatment, or alleviation of disease, injury, or handicap.

- Do not open the unit: the internal electronics pose a risk of electric shock.
- Do not use this apparatus near water.
- To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Objects filled with liquids should not be placed on the apparatus.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Only use secure industry-standard connectors and tubing for pressure connections. Faults, defects and mistakes due to wrong connections void warranty. DMT is not responsible for results and mistakes caused by inappropriate pressure hookup.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produces heat.
- Only use attachments and accessories specified by the manufacturer.
- Unplug this apparatus during lightning storms or when unused for long periods of time.

The 751mT is delivered with an external 100-240VAC to 24VDC adapter. Protect the power adapter and cord from being walked on or pinched. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply cord or plug being damaged, liquid or objects having fallen into the apparatus, exposures to rain or moisture, abnormal operation or having been dropped.

# CHAPTER 1 - SYSTEM OVERVIEW

## 1.1 Mini Tissue Organ Bath System - 751mT front panel

***Figure 1.1*** *751mT front view*

## 1.2 Mini Tissue Organ Bath System - 751mT rear panel

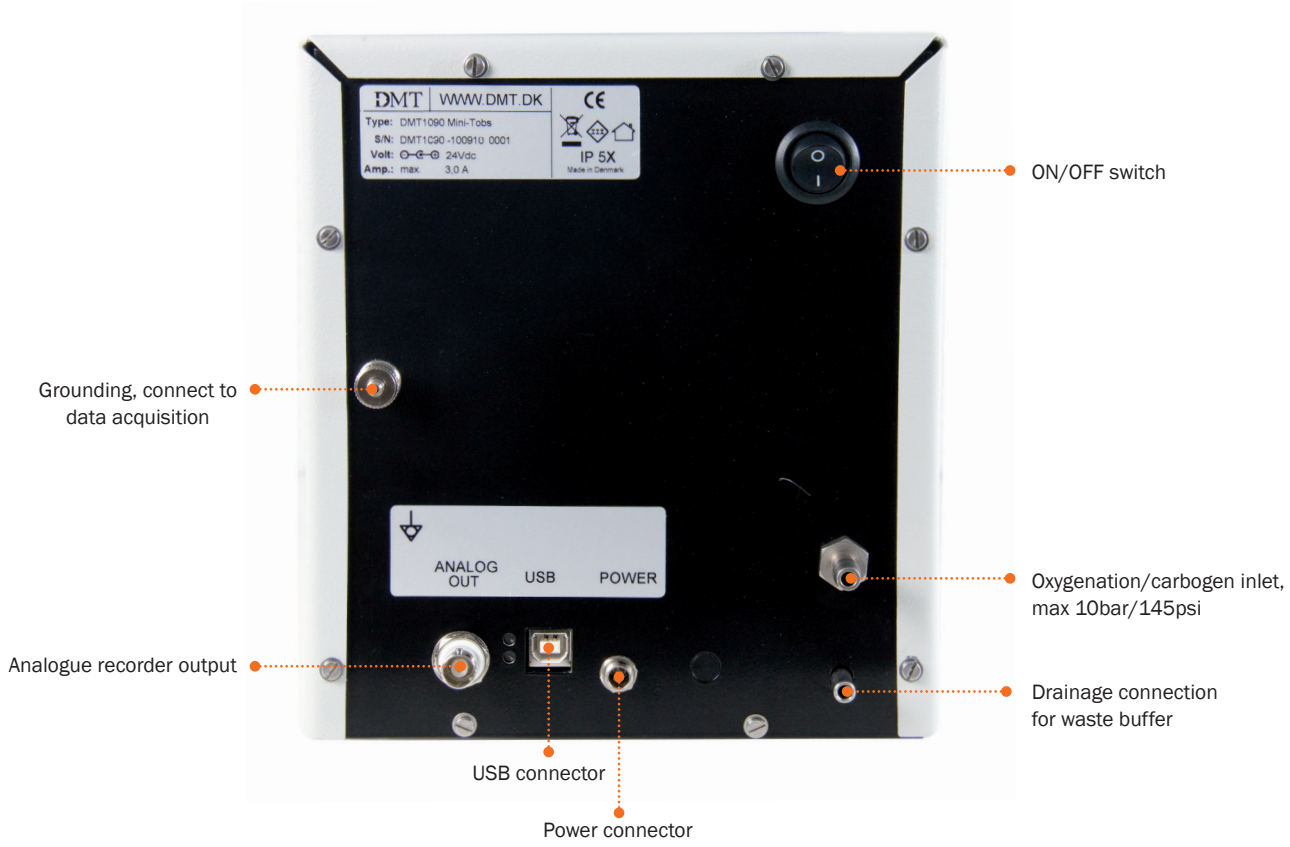
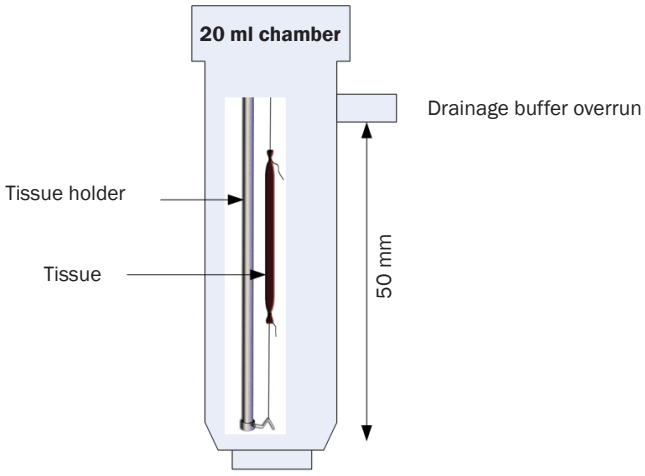



***Figure 1.2*** *751mT rear panel*

**IMPORTANT:**
**TO GET A NOISE-FREE RECORDED SIGNAL IT IS IMPORTANT TO CONNECT THE 751MT GROUND CONNECTION TO THE DATA ACQUISITION SYSTEM'S GROUND CONNECTION.**

## 1.3 Chamber with tissue




Temperature probe, buffer inlet, oxygenation/carbogen (gasses) and drainage at the bottom

***Figure 1.3*** *Glass chamber*

## 1.4 Different types of tissue sample holders

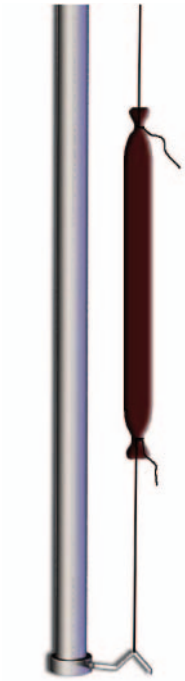


***Figure 1.4*** *Triangle hooks (standard)*

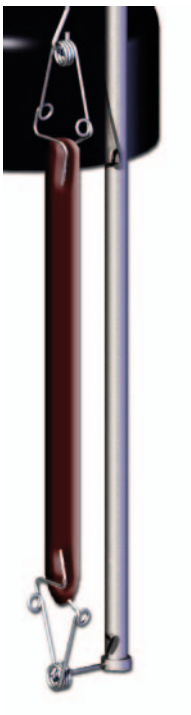


***Figure 1.5*** *Closing clips (optional)*

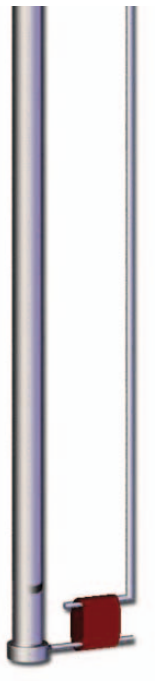


***Figure 1.6*** *Pins (optional)*

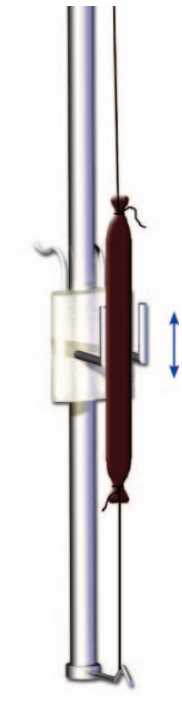


***Figure 1.7*** *Triangle hooks w/stimulation electrodes (optional)*

***Figure 1.8*** *Triangle hooks w/circular stimulation electrodes (optional)*

# CHAPTER 2 - SETTING UP

## 2.1 Mounting/Set-up

### Adjustment of the transducer and tissue holder position.

***Figure 2.2*** *Transducer and tissue holder*

1. **Vertical fine adjustment of the transducer**
   Turn the micrometer screw clockwise to lower the transducer. Turn counter clockwise to lift the transducer.
   The marked line is the lowest position of the transducer. The highest position is 20 mm above the line.

2. **Horizontal adjustment of the transducer**
   Turn the screw clockwise to free the transducer. The transducer can now be moved horizontal. Turn the screw counter-clockwise to lock the transducer.

3. **Course adjustment of the lower tissue holder**
   Turn the screw counter-clockwise to unlock the tissue holder. When unlocked it is possible to move the tissue holder up, down, left and right. Turn screw clockwise to lock.

## Tissue chamber handling

The following is a description of how to remove/place the tissue chamber.

1. Move the transducer upwards. Make sure the sample holder is free of the tissue chamber.
2. Open the chamber door
3. Removing the glass chamber: carefully pull the top of the chamber towards you a few millimetres until the chamber is free to move upwards. Then lift out.
4. Replacing the glass chamber: place the stub at the bottom of the chamber inside the chamber disc. Gently place the stub situated on the side of the glass chamber into the heating compartment.

***Figure 2.3*** *Chamber handling*

# CHAPTER 3 - KEY/FUNCTION DESCRIPTION

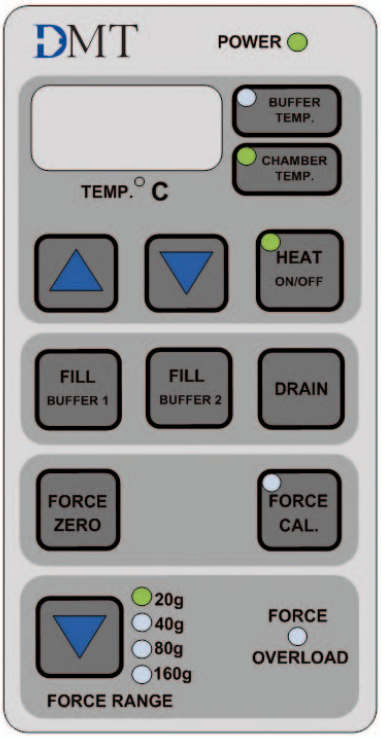
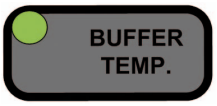



***Figure 3.1*** *Display/Keyboard*

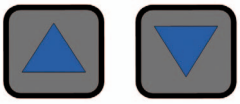
**Select Temperature**

To display the ***Buffer Temperature***, press the Buffer Temp. button. The LED on the button lights and the heating plate temperature is displayed.
To change the Set Point Temperature for the buffer, press the up or down Arrow Key. After the Arrow Key is pressed the Set Point Temperature is displayed. If the Arrow Keys are not touched for 7 seconds the display will return to the buffer temperature.




To display the ***Chamber Temperature***, press the Chamber Temp. button. The LED on the button lights and the Chamber Temperature is displayed.
To change the Chamber Set Point Temperature, press the up or down Arrow Key. After the Arrow Key is pressed the Chamber Set Point Temperature is displayed. If the Arrow Keys are not touched for 7 seconds the display will return to the Chamber Temperature.

**Arrow Buttons (up and down)**



**Heat ON/OFF**

This button is used for Chamber and Buffer Heat ON and OFF. The first time the button is pressed the buffer heater is activated and the LED is flashing. The second time the button is pressed the chamber heat is activated as well, and the chamber light is turned On, the LED is now lit constantly. The third time the button is activated the heat and chamber light is turned Off.

**Fill Buffer 1**

Fill the Chamber with buffer 1.

Press the button and hold it down; the “buffer 1” filling pump is running as long as the button is pressed. If the button is pressed for more than 60 seconds the pump stops, and the button must be pressed again to resume filling.

**Fill Buffer 2**

Fill the Chamber with buffer 2.

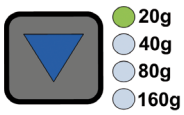
Press the button and hold it down; the “buffer 2” filling pump is running as long as the button is pressed. If the button is pressed for more than 60 seconds the pump stops, and the button must be pressed again to resume filling.

**Empty chamber**
A short press on the button activates the empty valve for 13 seconds. A new short press will deactivate the valve at any time. Draining will continue while the button is pressed.

**Zero the analog output**
Used to zero the analog output.

**Force calibration**
Used to store a new weight calibration.

**Force Range select**
When the button is pressed, the range shifts to the next level. The active range is indicated by the LED.




**Overload**
If the force input signal is out of range, the light diode is lit green.

# CHAPTER 4 - CALIBRATION

***Figure 4.1*** *Transducer with calibration weight*

## 4.1 Weight Calibration of the sensor Output

Prior to shipment the 751mT has gone through two days of continuous testing, including a final force transducer calibration. However, in order to ensure that the Tissue Organ Bath is working at highest performance, DMT recommends that a new force transducer calibration is performed before first use the Tissue Organ Bath System. The calibration is performed through the "Display/Keyboard" using the appropriate weight according to gain setting. As default the system is set with a weight range of ± 20g and the calibration is performed using a 5g weight (see figure 4.1 above).

## 4.2 The weight calibration procedure

1. Step 1: Remove weight from the transducer. Press button FORCE ZERO and hold it down until the display shows CAL. And the light diode in the button FORCE CAL lights up.

2. Step 2: Put the 5g weight on the transducer, and then press the FORCE CAL button.
   The analog output is now calibrated to give.

   - (± 2.5V out for ± 20g in the 20g. range)
   - (± 2.5V out for ± 40g in the 40g. range)
   - (± 2.5V out for ± 80g in the 80g. range)
   - (± 2.5V out for ± 160g in the 160g. range)

**NOTE:**
**IF YOU WANT TO ABORT THE CALIBRATION ROUTINE BEFORE IT IS FINISHED, JUST TURN OFF THE POWER.**

As a part of the general maintenance of the Tissue Organ Bath System, DMT recommends that the organ bath is weight-calibrated at least once every month. DMT also recommends that the bath is weight-calibrated every time the system has been moved or has not been used for a long period of time.

# CHAPTER 5 - MAINTENANCE

DMT recommends that the following sections are read carefully and that the instructions are followed at all times.

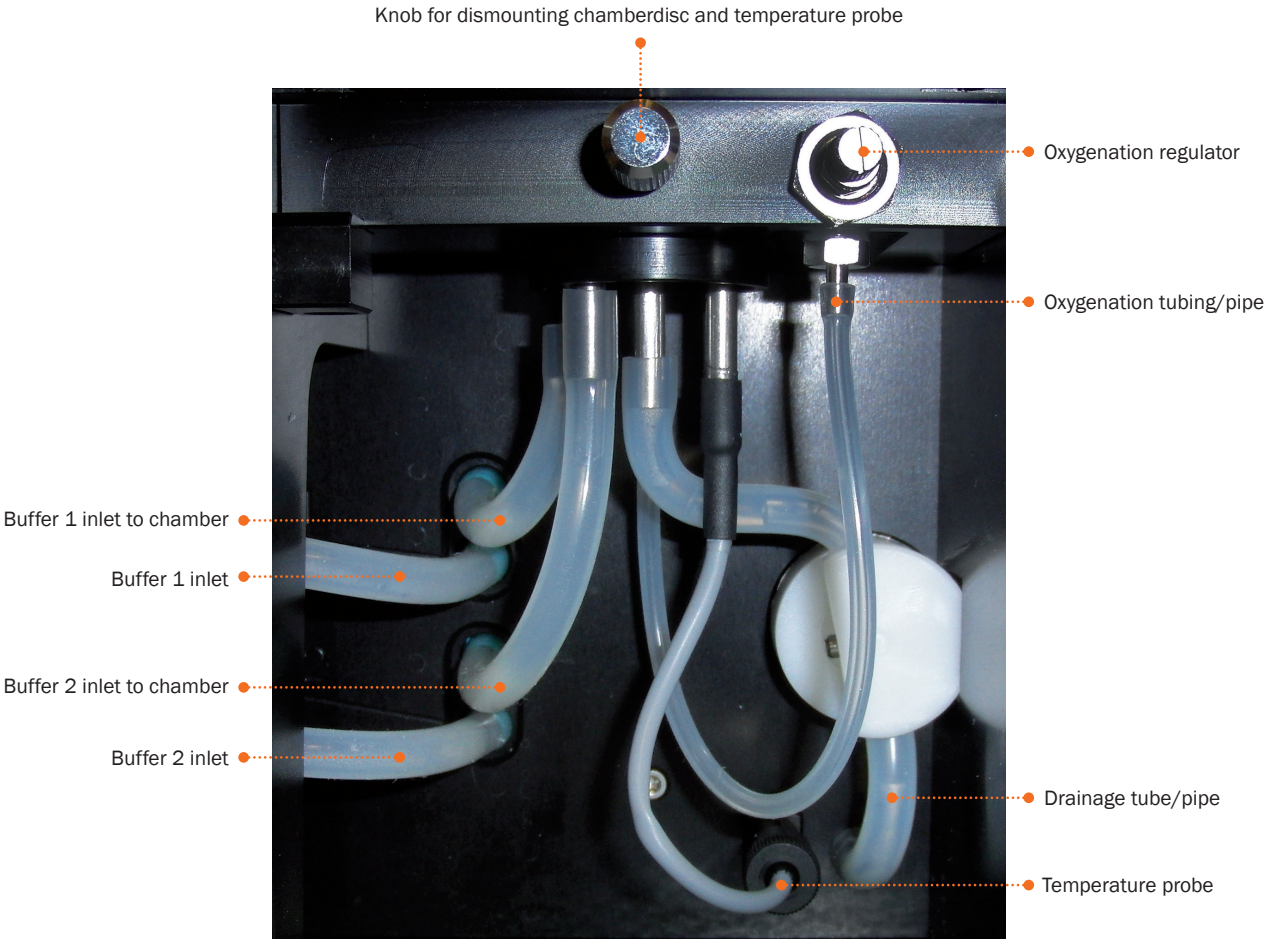



***Figure 5.1*** *Tubes connected to the chamber*

Change the tubing after use of unknown or toxic chemicals, or if any kind of hydrophobic reagent has been used.

The following tubes are changeable:

- Buffer 1 inlet
- Buffer 2 inlet
- Buffer inlet to chamber
- Oxygenation tubing/pipe
- Drainage tube/pipe

**IMPORTANT:**
**IT IS VERY IMPORTANT THAT THE TUBING USED IS THE ORIGINAL TUBING FROM DMT. THE QUALITY, DIAMETER AND LENGTH ARE SIGNIFICANT TO THE CHAMBER-FILLING MECHANISM.**

**NOTE:**
**REGARDING THE THREE OXYGENATION REGULATORS:**
**THE REGULATORS NEED TO BE GREASED AT LEAST TWICE A YEAR. ALSO ENSURE THAT THE REGULATORS ARE TURNED AT REGULAR INTERVALS TO PREVENT THEM FROM STICKING. PLEASE USE DMT GREASE.**

# APPENDIX 1 - SYSTEM SPECIFICATIONS

| | |
|---|---|
| **Power supply:** | 24VDC ± 10% |
| **Current max.:** | 3.3Amps. |
| **Dimensions LxDxH in cm:** | 45 x 26 x 30 |
| **Environmental humidity:** | 20% to 80% RH, non condensing |
| **Environmental operating temp.:** | 15-30°C |
| **Environmental storage temp.:** | 4-70°C |
| **Chamber size:** | 20ml. |
| **Chamber material:** | Glass |
| **Chamber heating:** | Heated air circulation |
| **Chamber temperature range:** | 20-40°C. (Never below room temperature) |
| **Chamber temp. resolution:** | 0.1°C |
| **Chamber temp. stability:** | ± 0.2°C. (When target temperature attained) |
| **Buffer bottle:** | 2 x 1litre |
| **Buffer-to-chamber filling rate:** | Max. 100ml/min. |
| **Buffer heating:** | Heating plate |
| **Buffer temperature range:** | 20-40°C. (Never below room temperature) |
| **Buffer temp. resolution:** | 0.1°C |
| **Buffer temp. stability:** | ± 3.0°C (When target temperature attained) |

**NOTE:**
**TO MINIMIZE THE HEATING TIME ONE CAN BENEFIT BY PRE-HEATING THE BUFFER TO 37°C BEFORE FILLING THE RESERVOIR BOTTLES FOR THE FIRST TIME IN THE DAY.**

| | |
|---|---|
| **Net weight:** | 8 kg. |
| **Analog output:** | BNC connector at the back, used to Connect to ext. acquisition box |
| **Analog output range:** | - Range 1: ± 20g ± 2.5Volt Resolution 0.01g.<br>- Range 2: ± 40g ± 2.5Volt Resolution 0.01g.<br>- Range 3: ± 80g ± 2.5Volt Resolution 0.01g.<br>- Range 4: ± 160g ± 2.5Volt Resolution 0.05g. |
| **Output impedance:** | <200 Ohm |
| **Air connection:** | Max. 10Bar |
| **USB connector:** | For Download of Firmware |

**Data of Isometric transducer**

| | |
|---|---|
| **Max. Range**: | ± 160gram |
| **Operating temperature:** | 20-40°C |
| **Frequency range:** | 0-50Hz |

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